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REMARKS

The Office action of April 16, 2004, has been carefully considered.

Claims 1 and 3 through 9 now stand rejected under 35 USC 103(a) over Leonard in view of Hausler.

Claims 1 and 8 have now been amended to better define the invention. In particular, Claims 1 and 8 have been amended to recite that the deposit being detected has a thermally insulating nature as disclosed in the specification at page 8, lines 19 through 21, and have also been amended to recite determining a threshold value for heat flux at the given distance from the heat source indicative of the presence of an insulating deposit of predetermined thickness, as disclosed in the specification at page 8, line 30 through page 9, line 5.

New independent Claim 13 now added to the application is directed to a method comprising applying a thermal gradient in a cyclical manner, and determining if variations in the measured heat flux correspond sufficiently to the variations in the application to indicate the presence of a deposit, as shown for example in present Figure 2 in the corresponding discussion on page 8 of the specification.

The claimed invention is based upon the discovery that the deposit which forms inside the pipe is of a thermally insulating nature. When there is no deposit, the thermal gradient which is applied to the pipe is carried substantially by the fluid being transported within the pipe, and little heat flux will be measured at a distance from the point of application of the heat. When there is a thermally insulating deposit, the fluid is insulated from the heat source, and the thermal gradient is carried substantially by the pipe wall. In that case, greater heat flux will be measured at a distance from the heat application.

The Leonard reference has been cited to show a method for

determining the nature of a fluid (air, oil, water) flowing within a pipe, by applying heat to a point of the pipe, and measuring the heat flux corresponding to the applied thermal gradient at a distance from the heat source.

The Office action concedes that Leonard does not specifically teach a method for determining the presence of a deposit within the pipe, but has cited Hausler for this purpose, stating that it would have been obvious to one of ordinary skill in the art to utilize the detector of Leonard to detect fouling, as it does not require immersed wire test probes within the pipe.

However, not only does Leonard not teach or suggest the determination of fouling within the pipe, this determination is contrary to the teachings of Leonard. Specifically, Leonard states on page 3, lines 22-25, that "[t]he heat transfer characteristics of steel to water and steel to air are markedly different and will swamp the effects of badly corroded interior surfaces, thin coatings and internal debris." Accordingly, Leonard utilizes the apparatus of his invention to avoid the effects of internal corrosion within the pipe, stating that the steel to fluid heat transfer is much greater than the effects of such corrosion. Thus, one of ordinary skill in the art would not use the Leonard apparatus as a substitute for the Hausler apparatus, to detect deposits within a pipe, since Leonard effectively states that it is not possible to do so with his apparatus. Leonard further suggests (page 6, lines 3-9) that an internal coating of paint be removed at the location of a test.

As is recognized in the Office action, the Hausler apparatus is disadvantageous as it requires the placement of a probe within the flowing fluid in the pipe. The placement of a probe in the flowing fluid may be avoided by following the teachings of the present application.

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Withdrawal of this rejection is accordingly requested.

Claims 2 and 10 have been rejected under 35 USC 103(a) over Leonard in view of Hausler and Ludington et al, which has been cited to show cycling of a heat source, but which is otherwise not specifically relevant to the subject matter of the claimed invention.

Withdrawal of this rejection is accordingly requested.

Claims 11 and 12 have been rejected under 35 USC 103(a) over Leonard in view of Hausler and further in view of Baraona. Baraona also does not cure the defects of Leonard and Hausler, and withdrawal of this rejection is requested.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,

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